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Installation
and
Operating
Instructions

# CULLIGAN®
# MARK 89 AND 812
## AUTOMATIC
## WATER CONDITIONER

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Printed in USA

***Attention Culligan Customer:***

Your local independently operated Culligan dealer employs trained service and maintenance personnel who are experienced in the installation, function and repair of Culligan equipment. This publication is written specifically for these individuals and is intended for their use.

We encourage Culligan users to learn about Culligan products, but we believe that product knowledge is best obtained by consulting with your Culligan dealer. Untrained individuals who use this manual assume the risk of any resulting property damage or personal injury.

**WARNING - Prior to servicing equipment, disconnect power supply to prevent electrical shock.**

**This system is not intended to be used for treating water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.**

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# Introduction

The Culligan® Mark 89 and 812 water softeners are tested and validated by WQA to ANSI/NSF Standard 44 for the effective reduction of calcium and magnesium (hardness) along with barium and Radium 226/228*.

***SAFE PRACTICES***

Throughout this manual there are paragraphs set off by special headings.

NOTICE: Notice is used to emphasize installation, operation or maintenance information which is important, but does not present any hazard.

Example: NOTICE: *The nipple must extend no more than 1 inch above the cover plate.*

⚠ **CAUTION**: Caution is used when failure to follow directions could result in damage to equipment or property. Example:

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⚠ **CAUTION:** ***Disassembly while under water pressure can result in flooding.***

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⚠ **WARNING**: Warning is used to indicate a hazard which could cause injury or death if ignored. Example:

⚠ **WARNING! ELECTRICAL SHOCK HAZARD! UNPLUG THE UNIT BEFORE REMOVING THE TIMER MECHANISM OR COVER PLATES!**

***SERIAL NUMBERS***

The control valve serial number, is on the back of the timer case.

The media tank serial number is on the top edge of the tank side wall.

NOTICE: *Do not remove or destroy the serial number. It must be referenced on request for warranty repair or replacement.*

This publication is based on information available when approved for printing. Continuing design refinement could cause changes that may not be included in this publication.

* Verified utilizing hardness surrogate per ANSI/NSF Standard 44.

# Specifications

## Culligan® Mark 89 and 812 Water Conditioners with Automatic Time Clock or Soft-Minder® Meter

| | 89 Model | 812 Model |
|---|---|---|
| Control Valve | 5-cycle, Reinforced Thermoplastic | 5-cycle, Reinforced Thermoplastic |
| Overall Conditioner Height | 51 in | 51 in |
| | 1 29.5 cm | 1 29.5 cm |
| Media Tank Dimensions (Dia x Ht) | 9 x 45 in | 12 x 45 in |
| | 23 x 114 cm | 30 x 114 cm |
| Salt Storage Tank Dimensions (Dia x Ht) | 16 x 43 in | 16 x 43 in |
| | 41 x 109 cm | 41 x 109 cm |
| | 18 x 43 in | |
| | 46 x 109 cm | |
| Exchange Media, Type and Quantity | Cullex® Media, 0.7 cu.ft. | Cullex Resin, 1.4 cu. ft. |
| | Cullex Media, 20 L | Cullex Resin, 40 L |
| Underbedding, Type and Quantity | Cullsan® Underbed, 20 lb | Cullsan Underbed, 30 lb |
| | Cullsan Underbed, 9.1 kg | Cullsan Underbed, 13.6 kg |
| Exchange Capacity | 15,400 gr @ 4.0 lb | 25,000 gr @ 6.0 lb |
| @ Salt Dosage Per Recharge[1] | 998 gr @ 1.8 kg | 1 620 gr @ 2.7 kg |
| | 21,200 gr @ 7.7 lb | 35,900 gr @ 12.0 lb |
| | 1 374 gr @ 3.5 kg | 2 326 gr @ 5.4 kg |
| | 24,200 gr @ 12 lb | 42,400 gr @ 18.0 lb |
| | 1 568 gr @ 5.4 kg | 2 748 gr @ 8.2 kg |
| Freeboard to Media[2] | 18.9-19.9 in | 17.5-18.5 in |
| | 48-51 cm | 44-47 cm |
| Freeboard to Underbedding[3] | 39.2 in | 38.5 in |
| | 99.6 cm | 98 cm |
| Salt Storage Capacity | 250 lb or 375 lb | 375 lb |
| | 114 kg or 170 kg | 170 kg |
| Rated Service Flow @ Pressure Drop | 7.8 gpm @ 15 psi | 8.25 gpm @ 15 psi |
| Total Hardness, Maximum | 50 gpg | 75 gpg |
| | 1 300 mg/L | 1 700 mg/L |
| Total Iron, Maximum | 5 ppm | 5 ppm |
| | 5 mg/L | 5 mg/L |
| Hardness to Iron Ratio, Minimum[4] | 8 gpg to 1 ppm | 8 gpg to 1 ppm |
| | 140 mg/L to 1 mg/L | 140 mg/L to 1 mg/L |
| Operating Pressure | 20-125 psi | 20-125 psi |
| | 140-860 kPa | 140-860 kPa |
| Operating Temperature | 33-120°F | 33-120°F |
| | 1-50°C | 1-50°C |
| Electrical Requirements | 120V/60 Hz | 120V/60 Hz |
| Electrical Power Consumption, Min/Max | 3 Watts/35 Watts | 3 Watts/35 Watts |
| Drain Flow, Maximum[5] | 2.0 gpm | 3.5 gpm |
| | 7.6 L/pm | 13.5 L/pm |
| Recharge Time, Average[6] | 80 min | 85 min |
| Recharge Water Consumption, Average | 45 gal/4 lb | 75 gal/6 lb |
| | 170 L/1.8 kg | 284 L/2.7 kg |

1 Capacities and corresponding salt dosages pertain to low hardness waters. Capacities given are per recharge
2 Measured from top of media to top of inlet fitting (backwashed and drained).
3 Measured from top of underbedding to top of inlet fitting.
4 Hardness to iron ratio does not apply and total hardness and iron specifications change as follows when Sofner-Gard® accessory is used: 89 Model - 50 gpg (855 mg/L) total hardness, 10 ppm (mg/L) iron; 812 Model - 75 gpg (1 200 mg/L) hardness, 20 ppm (20 mg/L) iron.
5 Backwash at 120 psi (830 kPa).
6 10 minute backwash, 7 lb (3.2 kg) 89 model or 13 lb (5.9 kg) 812 model salt dosage.

# Preparation

## *COMPONENT DESCRIPTION*

The water conditioner is shipped from the factory in three cartons. Remove all components from their cartons and inspect them before starting installation.

**Control Valve Assembly** - Includes the 5-cycle regeneration control valve and timer assembly. A small parts package contains installation hardware and consumer literature, including an Owner's Guide and warranty policy.

**Media Tank** - Includes Tripl-Hull$_{TM}$ media tank complete with Cullex$_{®}$ ion exchange resin, underbedding and outlet manifold.

**Salt Storage Tank Assembly** - Includes salt storage container with support plate and Dubl-Safe$_{TM}$ brine refill valve and chamber.

**Bypass Valves** - The system installation includes a manually operated bypass valve which enables the softener to be isolated from the water service lines for maintenance and service and also maintain the continuity of the water supply when the softener is disconnected.

## *TOOLS AND MATERIALS*

The following tools and supplies will be needed, depending on installation method. **Observe all applicable codes.**

### All Installations

- Safety glasses
- Phillips screwdrivers, small and medium tip
- Gauge assembly (PN 00-3044-50 or equivalent)
- Silicone lubricant (PN 00-4715-07 or equivalent) - **DO NOT USE PETROLEUM-BASED LUBRICANTS**
- A bucket, preferably light-colored
- Towels

### Special Tools

- Torch, solder and flux for sweat copper connections
- Threading tools, pipe wrenches and thread sealer for threaded connections.
- Saw, solvent and cement for plastic pipe connections.

### Materials

- Brine line, 5/16" (PN 00-3031-28 or equivalent)
- Drain line, 1/2" (PN 00-3030-82, gray, semi-flexible; or PN 00-3319-46, black, semi-rigid; or equivalent)
- Thread sealing tape
- Pressure reducing valve (if pressure exceeds 125 psi [860 kPa], PN 00-4909-00 or equivalent)
- Pipe and fittings suited to the type of installation
- Water softener salt (rock, solar or pellet salt formulated specifically for water softeners)

## *APPLICATION*

**Water quality** - Verify that raw water hardness and iron are within limits. Note the hardness for setting the salt dosage and recharge frequency.

**Pressure** - If pressure exceeds 125 psi (860 kPa), install a pressure reducing valve (see materials checklist). On private water systems, make sure the minimum pressure (the pressure at which the pump starts) is greater than 20 psi (140 kPa). Adjust the pressure switch if necessary.

**⚠ CAUTION:** ***The use of a pressure reducing valve may limit the flow of water in the household.***

**Temperature** - Do not install the unit where it might freeze, or next to a water heater or furnace or in direct sunlight.

## ***LOCATION***

**Space requirements** - Allow 6-12 inches (15-30 cm) behind the unit for plumbing and drain lines and 4 feet (1.3 metres) above for service access and filling the salt container.

**Floor surface** - Choose an area with solid, level floor free of bumps or irregularities. **Bumps, cracks, stones and other irregularities can cause the salt storage tank bottom to crack when filled with salt and water.**

**Drain facilities** - Choose a nearby drain that can handle the rated drain flow (floor drain, sink or stand pipe). Refer to the Drain Line Chart, Table 1 (page 10), for maximum drain line length.

NOTICE: *Most codes require an anti-siphon device or airgap. Observe all local plumbing codes and drain restrictions. The system and installation must comply with all state and local laws and regulations.*

**Electrical facilities** - A 6-foot grounded cord is provided. The customer should provide a 3-prong grounded receptacle, preferably one not controlled by a switch that can be turned off accidentally. Observe local electrical codes.

**⚠ WARNING: ELECTRICAL SHOCK HAZARD! DO NOT REMOVE THE GROUNDING PRONG! IF THE RECEPTACLE IS DESIGNED ONLY FOR 2-PRONG PLUGS, OBTAIN A 3-PRONG ADAPTER AND GROUND IT SECURELY TO THE RECEPTACLE. DO NOT USE EXTENSION CORDS.**

# Installation

***PLACEMENT***

Refer to Fig. 1.

- Set the media tank on a solid, level surface near water, drain and electrical facilities. Place the outlet (black coupling) of the tank on the left.

- Set the brine system on a flat, smooth, solid surface as near the media tank as possible.

***MOUNT THE CONTROL VALVE***

See Fig. 2.

- Remove and discard the protective covers on the tankcouplings.
- Lubricate the o-rings on the tank couplings with silicon lubricant.
- Place the control on the tank couplings and press down firmly.
- Install the u-clamps on both sides of the control and secure with the screws.

***PLUMBING CONNECTIONS***

Two methods of connecting the water softener to the plumbing system are available. Shipped with each softener is a Culligan® Cul-Flo-Valv® bypass valve. If local conditions warrant, you may use the sweat adaptor kits, PN 00-3314-44 or 00-3314-45.

NOTICE: *The Soft-Minder® meter cannot be used with the sweat adaptors.*

**⚠ CAUTION:** ***Close the inlet supply line and relieve system pressure before cutting into the plumbing! Flooding could result!***

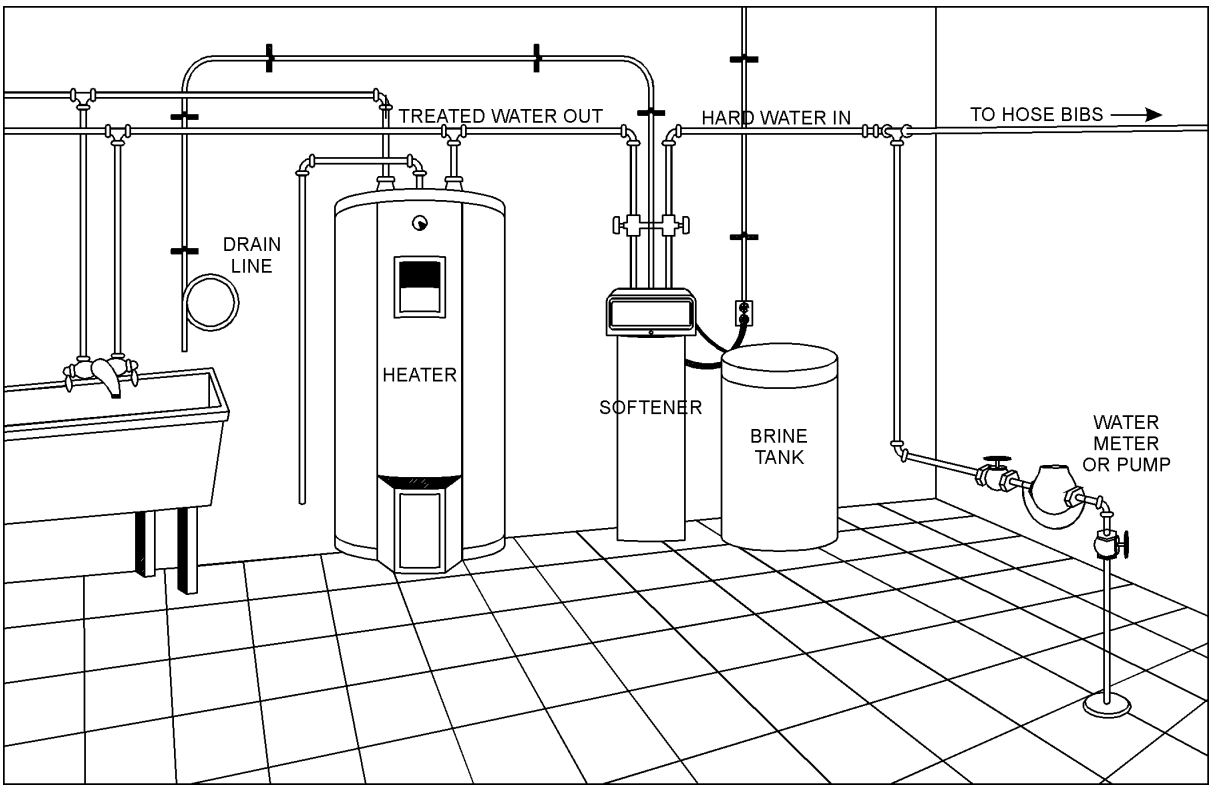



**FIG. 1**

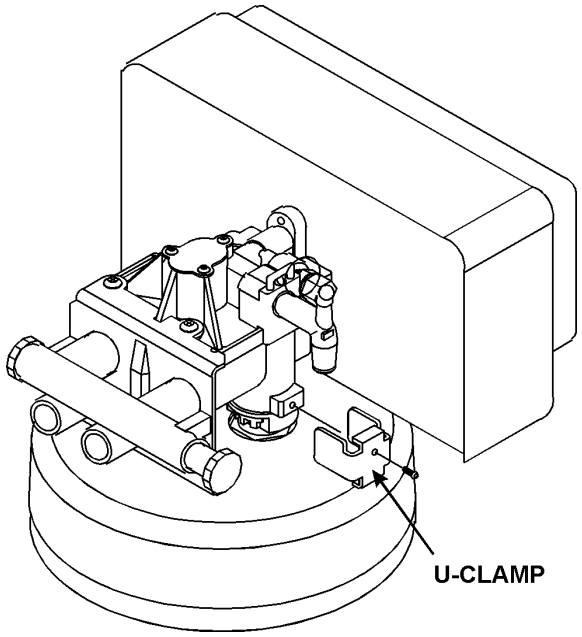



FIG. 2

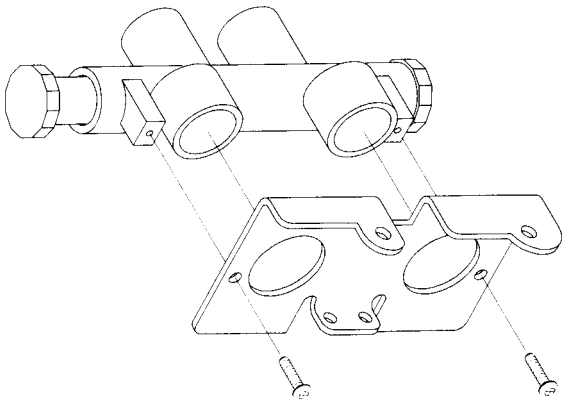


FIG. 3

⚠ **CAUTION:** ***When making sweat connections, remove all plastic and rubber components which contact brass or copper. Damage to these components may result otherwise.***

***BYPASS VALVE INSTALLATION - TIME CLOCK UNITS ONLY***

The bypass valve connects directly to the backplate of the valve with a pair of screws (Fig. 3). To facilitate this connection, remove the plate by pulling up on the u-clip on the back of the valve. Lubricate all o-rings with silicon lubricant.

***BYPASS VALVE INSTALLATION - SOFT-MINDER® METER ONLY***

The Soft-Minder meter is placed between the bypass valve and the control (Fig. 4). Make sure the meter is on the outlet port of the control. A pair of elongated bolts are packaged with the meter to hold the bypass valve to the back plate of the control. Lubricate all o-rings with silicon lubricant.

***SWEAT ADAPTOR INSTALLATION***

The sweat adaptors use a snap ring to hold them to the backplate of the control valve. The back plate will need to be removed from the valve for this connection. A pair of snap ring pliers, PN 00-5916-09, are needed for this connection.

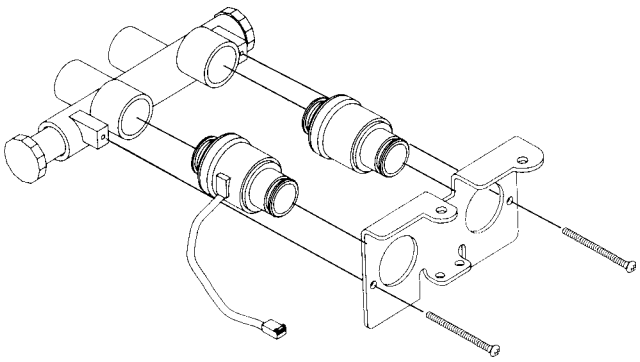


FIG. 4

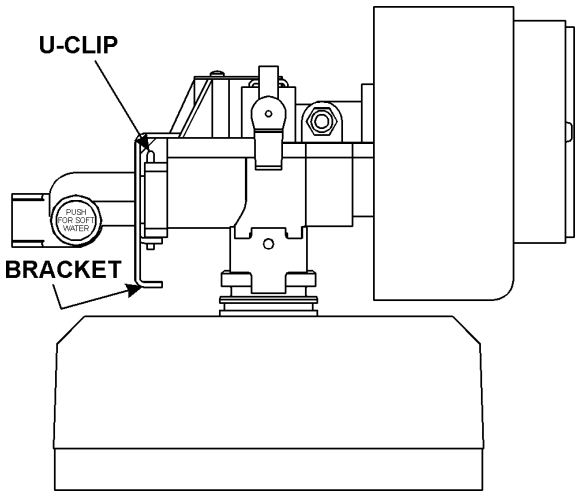



FIG. 5

**⚠ CAUTION:** ***When reinstalling back plate to control valve, make sure the u-clip fully engages the two bottom holes of the bracket (Fig. 5). Secure bracket from the top with the two mounting screws provided.***

### *CONNECT THE BRINE LINE*

Refer to Fig. 7.

- Measure a length of brine line sufficient to reach from the brine tank to the brine fitting and then add four feet (1.3 meters). Cut both ends squarely and cleanly.
- Remove the brine valve from the brine tank and remove the white nut and insert. Return float rod to its original position.
- Slip the white nut over one end of the tubing and press the plastic insert into the end of the tubing. Connect to the brine valve and tighten nut. (Figure 6)
- Remove white nut and insert from wire tie around drain elbow.
- Slip the white nut over one end of the tubing and press the plastic insert into the end of the tubing. Connect to the brine connection on the valve and tighten nut.

### *DRAIN LINE CONNECTION*

Refer to Table 1, page 11 under the applicable tank size for drain line length and height limitations, and to Fig. 7.

- Remove 1/2" pipe clamp from end of drain elbow.
- Route a length of 1/2" drain line from the drain elbow to the drain.
- Fasten the drain line to the elbow with the clamp.
- Secure the drain line to the drain to prevent its movement during regeneration. A loop in the end of the tube will keep it filled with water and will reduce splashing at the beginning of each regeneration.

NOTICE: *Observe all plumbing codes. Most codes require an anti-siphon device or air gap at the discharge point!*

### *FILL THE SALT STORAGE CONTAINER*

Fill the salt storage container with water until the level reaches about 1 inch above the salt support plate. Pour salt into the container. Fill to within a few inches of the top.

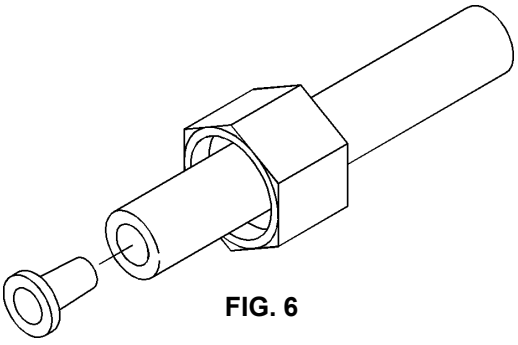


**FIG. 6**

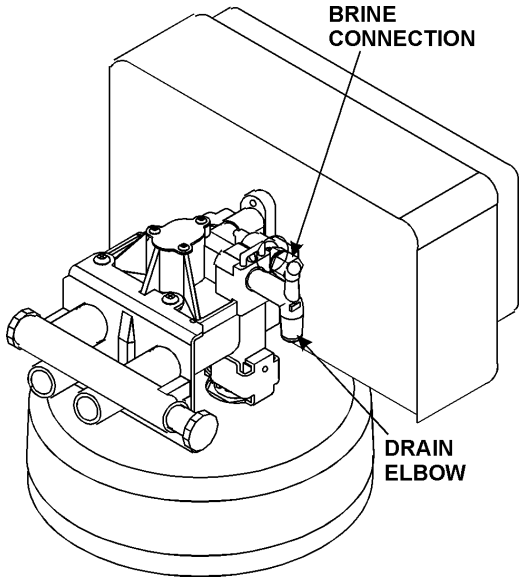



**FIG. 7**

### *SOFT-MINDER® METER CONNECTION*

To connect the meter leads, refer to the instructions listed below and the wiring schematic.

- Remove the timer face plate & set it aside.
- Remove the two screws holding the timer cover. Set the timer cover aside.
- Locate the 1/2" hole in the timer plate at the center rear. Remove the plastic plug.
- Slip the meter cable through the hole and toward the circuit board.
- Connect the red wire from the flow meter cable to the common terminal of the lockout switch. Connect the red wire from the flow meter connection to the normally closed terminal of the lockout switch.
- Connect the flow meter harness to the circuit board. The meter terminal is labeled "METER".
- Locate the strain relief bushing in the parts pack. Place it on the cable at the point of entry to the rear of the timer plate and push it into the hole.

### *TABLE 1*

### *9-INCH MODELS*

| Average Water Pressure | Height of Drain Discharge Above Floor Upon Which Softener Sets | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| psi | 4 in. | 1 ft | 2 ft | 3 ft | 4 ft | 5 ft | 6 ft | 7 ft | 8 ft | 9 ft | 10 ft |
| kPa | 0.1 m | 0.3 m | 0.6 m | 0.9 m | 1.2 m | 1.5 m | 1.8 m | 2.1 m | 2.4 m | 2.7 m | 3.1 m |
| 30 | 56 | 50 | 40 | 30 | 20 | 10 | | | | | |
| 2.1 | 17.1 | 15.3 | 12.2 | 9.2 | 6.1 | 3.1 | | | | | |
| 50 | 112 | 106 | 96 | 86 | 76 | 66 | 56 | 46 | 36 | 26 | 16 |
| 3.5 | 34.2 | 32.3 | 29.3 | 26.2 | 23.2 | 20.1 | 17.1 | 14.0 | 11.0 | 7.9 | 4.9 |
| 70 | 143 | 137 | 127 | 117 | 107 | 97 | 87 | 77 | 67 | 57 | 47 |
| 4.8 | 43.6 | 41.8 | 38.7 | 35.7 | 32.6 | 29.6 | 26.5 | 23.5 | 20.4 | 17.4 | 14.3 |
| 90 | 153 | 147 | 137 | 127 | 117 | 107 | 97 | 87 | 77 | 67 | 57 |
| 6.2 | 46.7 | 44.8 | 41.8 | 38.7 | 35.7 | 32.6 | 29.6 | 26.5 | 23.5 | 20.4 | 17.4 |
| 120 | 159 | 153 | 143 | 133 | 123 | 113 | 103 | 93 | 83 | 73 | 63 |
| 8.3 | 48.5 | 46.7 | 43.6 | 40.6 | 37.5 | 34.5 | 31.4 | 38.4 | 25.3 | 22.3 | 19.2 |

### *12-INCH MODELS*

| Average Water Pressure | Height of Drain Discharge Above Floor Upon Which Softener Sets | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| psi | 4 in. | 1 ft | 2 ft | 3 ft | 4 ft | 5 ft | 6 ft | 7 ft | 8 ft | 9 ft | 10 ft |
| kPa | 0.1 m | 0.3 m | 0.6 m | 0.9 m | 1.2 m | 1.5 m | 1.8 m | 2.1 m | 2.4 m | 2.7 m | 3.1 m |
| 30 | 44 | 38 | 28 | 18 | | | | | | | |
| 2.1 | 13.4 | 11.6 | 8.5 | 5.5 | | | | | | | |
| 50 | 103 | 97 | 87 | 77 | 67 | 57 | 47 | 37 | 27 | 17 | 7 |
| 3.5 | 31.4 | 29.6 | 26.5 | 23.5 | 20.4 | 17.4 | 14.3 | 11.3 | 8.2 | 5.2 | 2.1 |
| 70 | 129 | 123 | 113 | 103 | 93 | 83 | 73 | 63 | 53 | 43 | 33 |
| 4.8 | 39.3 | 37.5 | 34.5 | 31.4 | 28.4 | 25.3 | 22.3 | 19.2 | 16.2 | 13.1 | 10.1 |
| 90 | 145 | 139 | 129 | 119 | 109 | 99 | 89 | 79 | 69 | 59 | 49 |
| 6.2 | 44.2 | 42.4 | 39.3 | 36.3 | 33.2 | 30.2 | 27.1 | 24.1 | 21.0 | 18.0 | 14.9 |
| 120 | 153 | 147 | 137 | 127 | 117 | 107 | 97 | 87 | 77 | 67 | 57 |
| 8.3 | 46.7 | 44.8 | 41.8 | 38.7 | 35.7 | 32.6 | 29.6 | 26.5 | 23.5 | 20.4 | 17.4 |

# Settings

The Mark 89 and 812 Water Conditioners are designed to perform efficiently on a wide range of water supplies. Before the unit can be recharged and put into service, several settings must be made.

### ***BACKWASH***

Backwash, the first step in the recharge cycle, expands and loosens the resin bed, and flushes away accumulated turbidity. The backwash interval is preset at the factory for 10 minutes, which is adequate for most water supplies. It is adjustable, however, from 5 to 30 minutes. It is recommended that backwash last long enough so that the effluent from the drain line is clear. Backwash too long and water is wasted, not long enough and the tank becomes fouled with sediment.

If backwash time adjustment is needed, refer to Fig. 8.

- Grasp the front cover by the slots and carefully pull forward to remove cover. Lay the cover aside in a safe place.
- Loosen screw (A) about 1½ turns. DO NOT loosen screw (B).
- Holding the cam gear (located beneath the backwash dial), rotate the backwash dial (C) until the desired backwash time lines up with indicator mark (D).
- Tighten screw (A).

NOTICE: *Adjusting the backwash time may cause the salt dosage setting to change. If the salt dosage needs to be reset, do not tighten screw (A), and refer to the Salt Dosage section.*

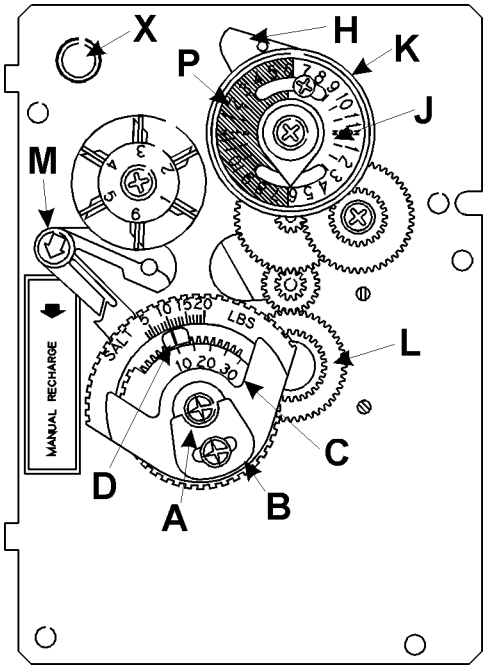


**FIG. 8**

### ***TIME OF RECHARGE***

Although the need to recharge is determined by the Soft-Minder control, time of day the conditioner will actually recharge can be set on the timer mechanism.

The timer is factory set to recharge about 2:00 a.m., a time when water usage is at a minimum for most families. If water is drawn during recharge, hard water will automatically be bypassed to service. If it would be more convenient to have the water conditioner recharge at a different time of day, the setting may be changed as follows, referring to Fig. 8.

- Remove the timer cover.
- The position of the peg (H) in relation to the time-of-day dial (J) determines the time when the unit will begin to recharge.
- Loosen the screw and lift the white time-of-day dial and rotate it until the desired time of recharge is opposite the peg (H). Please note that whenever the time of recharge is changed, the time-of-day setting may be changed also.

NOTICE: *Whenever the time of recharge is changed the time of day must be reset also.*

### ***TIME OF DAY***

Upon completing the installation, the timer must be set to the correct time of day. Time of day must also be reset after any kind of power interruption, such as that caused by an electrical storm. See Fig. 8.

- Determine the correct time of day.
- Grasp the gear (K) and lift straight up (the white time-of-day dial will lift with it). Rotate the gear until the correct time of day lines up with the pointer (P). The dial is spring-loaded and will return its position when released. Make sure the teeth mesh.

Note that the silver half of the time-of-day dial designates the daytime hours, while the black half designates the night-time hours.

### *GUEST CYCLE*

An extra recharge can be initiated any time extra soft water is required by pushing the Manual Recharge lever (M) in the direction of the arrow, then releasing. The unit will still recharge at its regular frequency as determined by the meter device. On models with meter control, the red button (X) must also be pushed briefly before the recharge cycle can begin.

### *SERVICE POSITION*

The timer assembly is in the service position when the toothless notch in the cam gear is over the teeth on the idler gear (L). The timer will return to this position after each recharge (Fig. 8).

### *TIME CLOCK SETTINGS*

To set the Mark 89 and 812 water conditioner for optimal performance, determine the hardness of the water along with the number of people in the household. Refer to Table 2. Locate the row corresponding to the number of people in the home and move across to the appropriate hardness column. The number in the shaded region is the salt dosage. The other number is the frequency of regeneration.

### *SALT DOSAGE*

To set the salt dosage, refer to Fig. 8. Loosen screw (A) and rotate outer dial until the salt dosage dial line up with the indicator mark (D). Tighten screw (A).

**TABLE 2A — CULLIGAN MARK 89 WATER CONDITIONER SALT DOSAGE — FREQUENCY**

| *Persons in Household | 0-7 (0-120) | 8-14 (121-240) | 15-21 (241-360) | 22-28 (361-480) | 29-35 (481-600) | 36-42 (601-720) | 43-49 (721-840) | 50-56 (841-960) | 57-63 (961-1080) | 64-75 (1081-1280) | Water Usage Gal. (Litres) per day |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1<br>5 | 1<br>5 | 1<br>7 | 2<br>5 | 2<br>6 | 3<br>5 | 3<br>6 | 3<br>8 | 3<br>9 | 6<br>5 | 150(570) |
| 3 | 1<br>5 | 1<br>7 | 2<br>5 | 2<br>7 | 3<br>6 | 3<br>9 | 6<br>5 | 6<br>5 | 6<br>6 | 6<br>8 | 225(850) |
| 4 | 1<br>5 | 2<br>5 | 2<br>7 | 3<br>6 | 3<br>9 | 6<br>5 | 6<br>6 | 6<br>8 | 6<br>9 | 6<br>12 | 300(1135) |
| 5 | 1<br>5 | 2<br>5 | 3<br>5 | 3<br>9 | 6<br>5 | 6<br>7 | 6<br>9 | 6<br>12 | 6<br>13 | | 375(1420) |
| 6 | 1<br>7 | 2<br>9 | 3<br>8 | 6<br>5 | 6<br>6 | 6<br>9 | 6<br>12 | | | | 450(1705) |
| 7 | 2<br>5 | 3<br>5 | 6<br>5 | 6<br>5 | 6<br>8 | 6<br>12 | | | | | 525(1990) |
| 8 | 2<br>5 | 3<br>7 | 6<br>5 | 6<br>6 | 6<br>9 | | | | | | 600(2270) |
| 9 | 2<br>5 | 3<br>9 | 6<br>5 | 6<br>7 | 6<br>13 | | | | | | 675(2555) |
| 10 | 2<br>5 | 3<br>12 | 6<br>5 | 6<br>9 | | | | | | | 750(2840) |

*In household application, not recommended for over 10 people because of pressure drop limitations.

## TABLE 2B — CULLIGAN MARK 812 WATER CONDITIONER SALT DOSAGE — FREQUENCY

| *Persons in Household | 0-7 (0-120) | 8-14 (121-240) | 15-21 (241-360) | 22-28 (361-480) | 29-35 (481-600) | 36-42 (601-720) | 43-49 (721-840) | 50-56 (841-960) | 57-63 (961-1080) | 64-75 (1081-1280) | Water Usage Gal. (Litres) per day |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | | | 1<br>9 | 2<br>7 | 3<br>6 | 3<br>8 | 3<br>11 | 3<br>12 | 6<br>9 | 6<br>9 | 150(570) |
| 3 | | | 2<br>6 | 3<br>7 | 3<br>9 | 3<br>13 | 6<br>7 | 6<br>10 | 6<br>11 | 6<br>14 | 225(850) |
| 4 | | | 3<br>6 | 3<br>8 | 6<br>6 | 6<br>8 | 6<br>11 | 6<br>12 | 6<br>17 | 6<br>20 | 300(1135) |
| 5 | | | 3<br>7 | 6<br>5 | 6<br>7 | 6<br>10 | 6<br>14 | 6<br>18 | 6<br>20 | | 375(1420) |
| 6 | 1<br>8 | 3<br>5 | 3<br>9 | 6<br>7 | 6<br>9 | 6<br>13 | 6<br>18 | 6<br>20 | | | 450(1705) |
| 7 | 2<br>5 | 3<br>6 | 6<br>5 | 6<br>8 | 6<br>12 | 6<br>16 | 6<br>20 | | | | 525(1990) |
| 8 | 2<br>5 | 3<br>6 | 6<br>6 | 6<br>8 | 6<br>13 | 6<br>20 | | | | | 600(2270) |
| 9 | 2<br>6 | 3<br>8 | 6<br>6 | 6<br>11 | 6<br>16 | | | | | | 675(2555) |
| 10 | 2<br>7 | 3<br>9 | 6<br>7 | 6<br>12 | 6<br>20 | | | | | | 750(2840) |

*In household application, not recommended for over 10 people because of pressure drop limitations.

### *REGENERATION FREQUENCY*

To set the regeneration frequency, push the number of pins in which corresponds to the number located in Table 2 (refer to Fig. 9 and Table 3).

### *SOFT-MINDER METERING DEVICE*

The Mark 89 and 812 Soft-Minder water conditioners are equipped with water meter which regenerates based upon the water consumption patterns of the household.

## TABLE 3 — RECHARGE FREQUENCY

| No. Down on Salt Chart | Pin No. In on Frequency Dial | Recharge Frequency |
|---|---|---|
| 1 | 1 | Every six days |
| 2 | 1 & 4 | Every three days |
| 3 | 1, 3 & 5 | Every other day |
| 6 | All Pins | Every day |

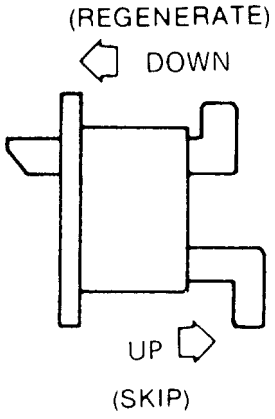



**FIG. 9**

## ***GALLONS SETTING***

Determine the daily use for the household. Usually 75-100 gallons per day per person is adequate. Using Table 4, locate the hardness range for your water supply. Move down the column and locate the gallons setting and salt dosage which best suits the application. Usually two to three days between regenerations yields the best results. Allow for one half to one days water usage as reserve capacity. Set the salt dosage per the instructions on page 9.

Set the gallons setting on the circuit board. This is done by removing the two screws of the front cover. The circuit board is located on the upper left hand corner of the back plate. A set of six dip switches on the circuit board determine the gallons capacity. Refer to Table 5, Figs. 10 and 11 when setting the dip switches. Make sure all recharge frequency pins are pushed on.

There are two pilot lights located on the circuit board.

- The green pilot light flickers when water is flowing through the water meter.
- The amber pilot light is a latching indicator, when the preset gallons count has passed, the amber light will illuminate indicating that the unit will regenerate that night.

The softener also has a ten gallon setting to assist the service personnel in trouble shooting the equipment. To trouble shoot the meter, set the dip switches to the OFF position. Run water into a measured pail. The green light will flicker. When ten gallons has passed, the amber light will light up. This will help determine if the meter is properly measuring the gallons count.

**TABLE 4A — MARK 89 (0.7FT³) GALLON CAPACITIES TO SIGNAL (RESERVE)**
**TOTAL WATER HARDNESS IN GRAINS PER GALLON (mg/l)**

| SALT DOSAGE | 0-10 (0-170) | 11-20 (171-340) | 21-30 (341-515) | 31-40 (516-685) | 41-50 (686-855) | 51-60 (856-1025) | 61-75 (1026-1280) |
|---|---|---|---|---|---|---|---|
| 4 | 1300 (290) | 600 (175) | 300 (230) | NA | NA | NA | NA |
| 5 | 1500 (250) | 600 (275) | 400 (183) | 300 (138) | NA | NA | NA |
| 6 | 1600 (275) | 700 (238) | 400 (225) | 300 (169) | NA | NA | NA |
| 7 | 1700 (250) | 700 (275) | 400 (250) | 300 (188) | 200 (190) | NA | NA |
| 8 | 1800 (200) | 800 (200) | 500 (167) | 300 (200) | 200 (200) | NA | NA |
| 10 | 1800 (210) | 800 (205) | 500 (170) | 300 (203) | 200 (202) | 200 (135) | NA |

**TABLE 4B — MARK 812 GALLON CAPACITIES TO SIGNAL (RESERVE)**
**TOTAL WATER HARDNESS IN GRAINS PER GALLON (mg/l)**

| SALT DOSAGE | 0-10 (0-170) | 11-20 (171-340) | 21-30 (341-515) | 31-40 (516-685) | 41-50 (686-855) | 51-60 (856-1025) | 61-70 (1026-1200) | 71-80 (1201-1370) | 81-90 (1371-1540) | 91-100 (1541-1700) |
|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 2500 (270) | 1100 (285) | 600 (323) | 400 (293) | 300 (254) | NA | NA | NA | NA | NA |
| 7 | 2700 (300) | 1200 (300) | 700 (300) | 500 (250) | 300 (300) | 300 (200) | NA | NA | NA | NA |
| 8 | 2900 (300) | 1300 (300) | 800 (266) | 500 (300) | 300 (340) | 300 (233) | NA | NA | NA | NA |
| 9 | 3000 (350) | 1400 (275) | 800 (316) | 500 (338) | 400 (270) | 300 (258) | 300 (178) | NA | NA | NA |
| 10 | 3100 (380) | 1500 (240) | 900 (260) | 600 (270) | 400 (296) | 300 (280) | 300 (197) | NA | NA | NA |
| 11 | 3100 (490) | 1500 (295) | 900 (297) | 600 (298) | 400 (318) | 300 (298) | 300 (212) | NA | NA | NA |
| 12 | 3100 (580) | 1600 (240) | 900 (327) | 600 (320) | 400 (336) | 400 (213) | 300 (225) | 300 (160) | NA | NA |
| 13 | 3100 (650) | 1600 (275) | 1000 (250) | 600 (358) | 500 (250) | 400 (225) | 300 (236) | 300 (169) | NA | NA |
| 14 | 3100 (710) | 1600 (305) | 1000 (270) | 700 (353) | 500 (262) | 400 (235) | 300 (244) | 300 (176) | NA | NA |
| 15 | 3100 (740) | 1600 (320) | 1000 (280) | 700 (260) | 500 (268) | 400 (240) | 300 (248) | 300 (180) | 300 (126) | NA |
| 16 | 3100 (780) | 1700 (240) | 1000 (293) | 700 (270) | 500 (276) | 400 (247) | 300 (254) | 300 (185) | 300 (131) | 200 (188) |
| 17 | 3100 (790) | 1700 (245) | 1000 (296) | 700 (273) | 500 (278) | 400 (248) | 300 (256) | 300 (186) | 300 (132) | 200 (189) |
| 18 | 3100 (780) | 1700 (240) | 1000 (296) | 700 (270) | 500 (276) | 400 (247) | 300 (254) | 300 (185) | 300 (131) | 200 (188) |

***Brine Valve "A" Dimension***

The brine valve contains a float-actuated safety shut-off device to prevent overflow of the brine tank in the un likely case of an electrical or mechanical failure during the brine tank refill cycle.

It is recommended that the brine valve float be used as intended, that is, as a **secondary**, safety shutoff. Remember, the timer mechanism provides the primary refill shut-off. To use the float as a safety shut-off, refer to Table 6 for the salt dosage and brine tank size being used. The "A" dimension is the distance between the filter screen and the bottom of the float (Fig. 12) when the float stem is in its fully raised position; adjust the float and rubber grommets accordingly.

***RAPID RINSE***

The rapid rinse time, which is established when setting the salt dosage, is usually adequate for most installations. It may be increased, if necessary, but it MUST NEVER be reduced from the salt dosage which is required for adequate regeneration.

To adjust rapid rinse refer to the section on Salt Dosage. Each one-pound increase in salt dosage will increase rapid rinse time, the brine valve float will become the **primary** brine refill shutoff. In this case refer to the correct Table 7 column for the salt dosage and brine tank size being used, and adjust the "A" dimension accordingly.

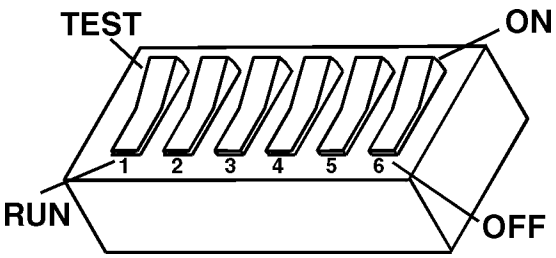



**FIG. 10**

| | RUN | TEST |
|---|---|---|
| SW-1 | OFF | ON |

**FIG. 11**

## TABLE 5 — REGENERATION SCHEDULE

| CAPACITY | SWITCH POSITION | | | | |
|---|---|---|---|---|---|
| (GALS.) | SW2 | SW3 | SW4 | SW5 | SW6 |
| 10 | OFF | OFF | OFF | OFF | OFF |
| 100 | ON | OFF | OFF | OFF | OFF |
| 200 | OFF | ON | OFF | OFF | OFF |
| 300 | ON | ON | OFF | OFF | OFF |
| 400 | OFF | OFF | ON | OFF | OFF |
| 500 | ON | OFF | ON | OFF | OFF |
| 600 | OFF | ON | ON | OFF | OFF |
| 700 | ON | ON | ON | OFF | OFF |
| 800 | OFF | OFF | OFF | ON | OFF |
| 900 | ON | OFF | OFF | ON | OFF |
| 1000 | OFF | ON | OFF | ON | OFF |
| 1100 | ON | ON | OFF | ON | OFF |
| 1200 | OFF | OFF | ON | ON | OFF |
| 1300 | ON | OFF | ON | ON | OFF |
| 1400 | OFF | ON | ON | ON | OFF |
| 1500 | ON | ON | ON | ON | OFF |
| 1600 | OFF | OFF | OFF | OFF | ON |
| 1700 | ON | OFF | OFF | OFF | ON |
| 1800 | OFF | ON | OFF | OFF | ON |
| 1900 | ON | ON | OFF | OFF | ON |
| 2000 | OFF | OFF | ON | OFF | ON |
| 2100 | ON | OFF | ON | OFF | ON |
| 2200 | OFF | ON | ON | OFF | ON |
| 2300 | ON | ON | ON | OFF | ON |
| 2400 | OFF | OFF | OFF | ON | ON |
| 2500 | ON | OFF | OFF | ON | ON |
| 2600 | OFF | ON | OFF | ON | ON |
| 2700 | ON | ON | OFF | ON | ON |
| 2800 | OFF | OFF | ON | ON | ON |
| 2900 | ON | OFF | ON | ON | ON |
| 3000 | OFF | ON | ON | ON | ON |
| 3100 | ON | ON | ON | ON | ON |

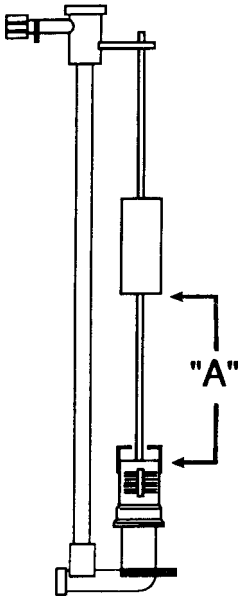



FIG. 12

## TABLE 6 - "A" DIMENSION CHART

| Salt Dosage (Pounds) | 160 lb. Brine Tank "A" Dimension Secondary (Only) | | 250 lb. Brine Tank "A" Dimension | | | | 375 lb. Brine Tank "A" Dimension | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Secondary | | Primary | | Secondary | | Primary | |
| | inches | (cm) | inches | (cm) | inches | (cm) | inches | (cm) | inches | (cm) |
| 3 | 6 | (15.2) | — | — | — | — | — | — | — | — |
| 4 | 7-3/4 | (19.7) | — | — | — | — | — | — | — | — |
| 5 | 9-1/2 | (24.1) | 8 | (20.3) | 6 | (15.2) | 6-1/2 | (16.5) | 4-1/2 | (11.4) |
| 6 | 1-1/4 | (28.6) | 9-3/8 | (23.8) | 7-3/8 | (18.7) | 7-1/2 | (19.0) | 5-1/2 | (14.0) |
| 7 | 13 | (33.0) | 10-7/8 | (27.6) | 8-7/8 | (22.5) | 8-1/2 | (21.6) | 6-1/2 | (16.5) |
| 8 | 14-3/4 | (37.5) | 12-1/4 | (31.1) | 10-1/4 | (26.0) | 9-1/2 | (24.1) | 7-1/2 | (19.0) |
| 9 | 16-1/2 | (42.0) | 13-5/8 | (34.6) | 11-5/8 | (29.5) | 10-1/2 | (26.7) | 8-1/2 | (21.6) |
| 10 | 18-1/4 | (46.3) | 15 | (38.1) | 13 | (33.0) | 11-1/2 | (29.2) | 9-1/2 | (24.1) |
| 11 | 20 | (51.0) | 16-3/8 | (41.6) | 14-3/8 | (36.5) | 12-1/2 | (31.7) | 10-1/2 | (26.7) |
| 12 | 21-3/4 | (55.2) | 17-3/4 | (45.1) | 15-3/4 | (40.0) | 13-1/2 | (34.3) | 11-1/2 | (29.2) |
| 13 | 21-1/2 | (59.7) | 19-1/8 | (48.6) | 17-1/8 | (43.5) | 14-1/2 | (36.8) | 12-1/2 | (31.7) |
| 14 | 25-1/4 | (64.1) | 20-1/2 | (52.1) | 18-1/2 | (47.0) | 15-1/2 | (39.4) | 13-1/2 | (34.3) |
| 15 | — | — | 21-7/8 | (55.5) | 19-7/8 | (50.5) | 16-1/2 | (42.0) | 14-1/2 | (36.8) |
| 16 | — | — | 23-1/4 | (59.0) | 21-1/4 | (54.0) | 17-1/2 | (44.5) | 15-1/2 | (39.4) |
| 17 | — | — | 24-5/8 | (62.5) | 22-5/8 | (57.5) | 18-1/2 | (47.0) | 16-1/2 | (42.0) |
| 18 | — | — | 26 | (66.0) | 24 | (61.0) | 19-1/2 | (49.5) | 17-1/2 | (44.5) |
| 19 | — | — | 27-3/8 | (69.5) | 25-3/8 | (64.5) | 20-1/2 | (52.1) | 18-1/2 | (47.0) |
| 20 | — | — | 28-3/4 | (73.0) | 26-3/4 | (68.0) | 21-1/2 | (54.6) | 19-1/2 | (49.5) |

# Start-Up Procedure

**⚠ WARNING: FOR PROTECTION, A SANITIZING AGENT HAS BEEN ADDED TO THE SOFTENER TANK AT THE FACTORY. THIS SANITIZING AGENT MUST BE FLUSHED OUT BEFORE THE UNIT IS PLACED INTO SERVICE BY RUNNING AT LEAST 50 GALLONS OF WATER THROUGH THE UNIT DRAIN.**

- Close the main supply valve.
- Set the bypass valve(s) to bypass.
- All faucets in the installation site should be closed.
- Direct the drain line discharge into a bucket where flow can be observed.
- Plug the unit into a 120 Volt, 60 Hertz, single phase grounded, 3-wire receptacle (or 2-wire receptacle with grounded 3-prong adapter).
- Set the timer to the correct time of day.
- Open the main supply valve.
- On the timer, push the Manual Recharge lever to the left until it stops.
- Slowly shift the Cul-Flo-Valv® bypass toward the "Soft Water" position until water flows. On three-valve bypass installations, close the bypass valve and open the outlet and inlet valves.
- Allow the unit to fill slowly until water flows from the drain line.
- When flow to drain is established, open the bypass fully. Watch the drain line discharge for signs of resin. If resin particles appear, reduce the flow. Increase the flow again when resin no longer appears in the discharge.
- When the unit is filled with water, return the timer to the service position.

**⚠ WARNING: ALTHOUGH NOT NORMALLY NECESSARY, SHOULD YOU NEED TO DISASSEMBLE ANY PART OF THE CONTROL VALVE OR REMOVE THE CONTROL FROM THE TANK ASSEMBLY OR ASSOCIATED PLUMBING, DEPRESSURIZE THE UNIT FIRST CLOSING THE MAIN SUPPLY VALVE, THEN OPEN A CONVENIENT FAUCET DOWN STREAM FROM THE WATER CONDITIONER.**

During the recharge cycle, hard water will be available to all the lines in the household. Immediately following recharge, the water to service will be soft.

Because of the volume of water contained in the water heater, the hot water may not be soft for several days. Soft hot water can be made available almost immediately, however, if the water heater is drained immediately after recharge and allowed to refill with soft water.

***BEFORE LEAVING THE INSTALLATION SITE***

**Make sure the brine tank is filled with water** to the level of the float. Fill the tank with a hose or put the unit into a full recharge so that the brine refill cycle will fill the tank.

**Explain the operation** of the softener to the customer. Give the customer a copy of the Owner's Guide and warranty policy. Make sure the customer knows that there will be new sounds associated with the recharging of the unit. Advise the customer to periodically check and replenish the salt supply.

**Clean up** the unit and the installation site, removing any soldering or pipe threading residues from the equipment with a damp towel.

# Appendix A - Sanitizing Instructions

A water softener in daily use on a potable water supply generally requires no special attention other than keeping the salt tank filled. Occasionally, however, a unit may require sanitation under one of the following conditions:

- The unit has stood idle for a week or more (the premises vacant or the residents on vacation).
- On private supplies, the appearance of off-tastes and odors, particularly if musty or "rotten egg" (caused by harmless sulfate-reducing bacteria).

For occasional occurrences, the softener can be sanitized with household bleach as follows.

NOTICE: *If the water supply contains iron, regenerate the softener before sanitizing to remove accumulated iron from the Cullex® resin.*

> ⚠ **WARNING: HAZARD FROM TOXIC FUMES! CHLORINE BLEACH AND COMMON IRON CONTROL CHEMICALS MAY GENERATE TOXIC FUMES WHEN MIXED.**

- **IF THE UNIT USES CULLIGAN® SOFNER-GARD™ CHEMICAL OR OTHER COMPOUNDS CONTAINING SODIUM HYDROSULFITE OR SODIUM BISULFITE, OR ANY OTHER REDUCING AGENT, DISCONNECT THE DEVICE AND MANUALLY REGENERATE THE UNIT BEFORE SANITIZING.**

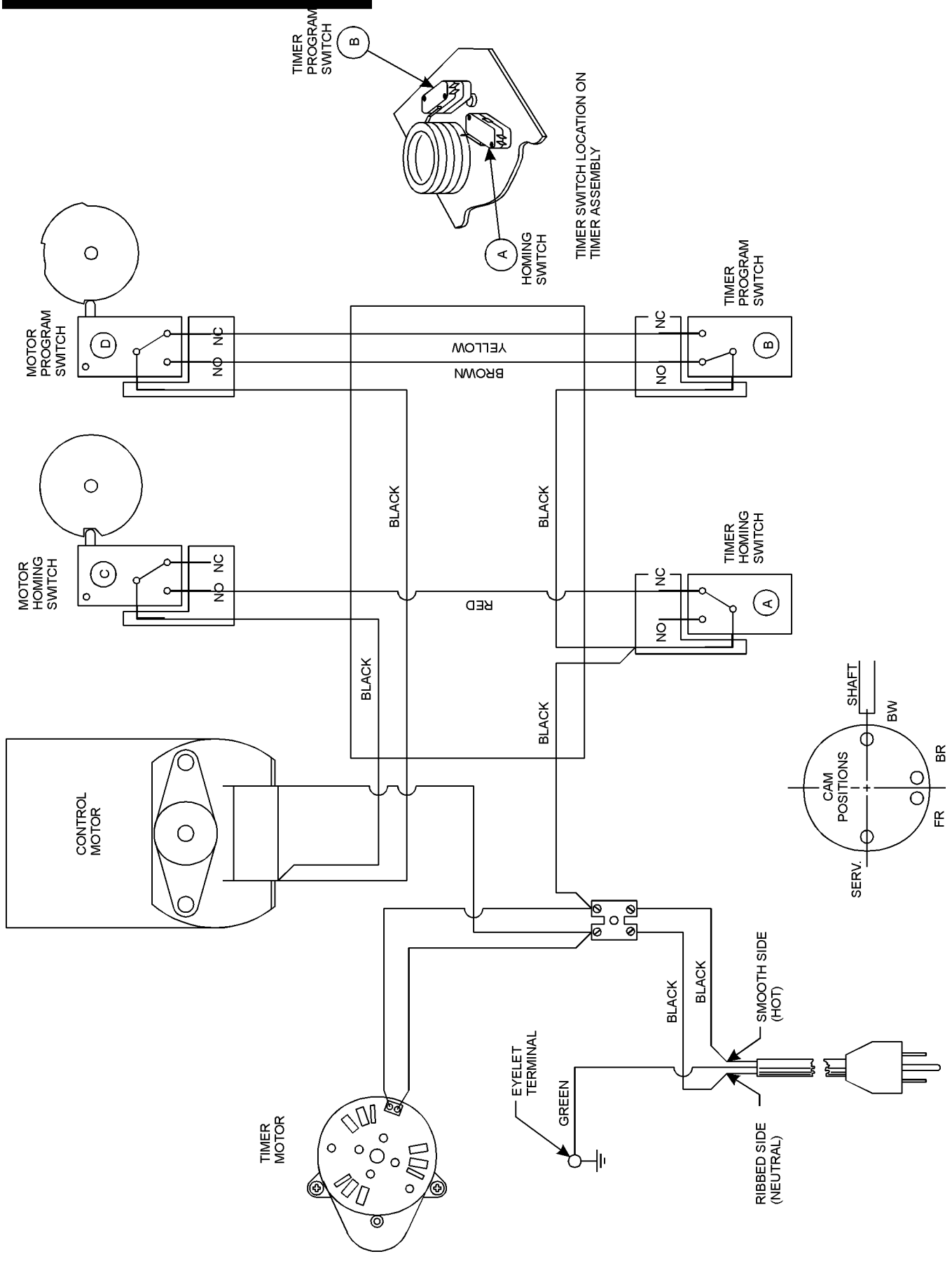
- **DO NOT USE THIS PROCEDURE IF THE SOFTENER SALT CONTAINS IRON CONTROL ADDITIVES.**

1. Remove the brine tank cover and the small cover on the brine valve chamber.
2. Pour directly into the brine chamber 1 cup (9-inch units) or 2 cups (12-inch units) of common household bleach (5-1/4% sodium hypochlorite).
3. Manually start a recharge cycle. Allow the unit to complete the recharge cycle automatically.

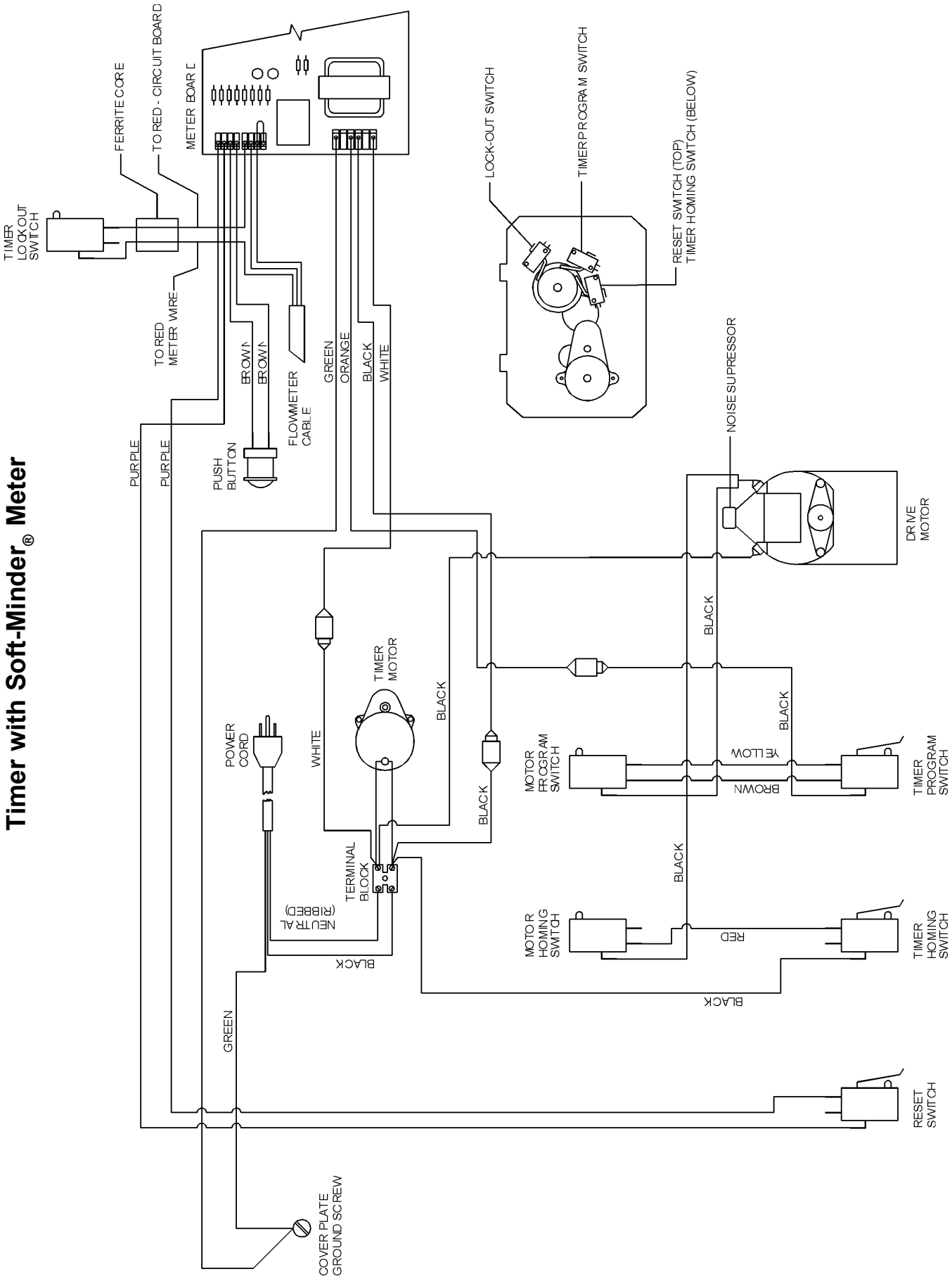
If tastes and odors return frequently, even after sanitization, a continuous chlorination system may be needed. Contact Household Application Engineering for assistance. Also, have the consumer send a sample to a qualified laboratory for bacterial analysis.

# Wiring Schematic

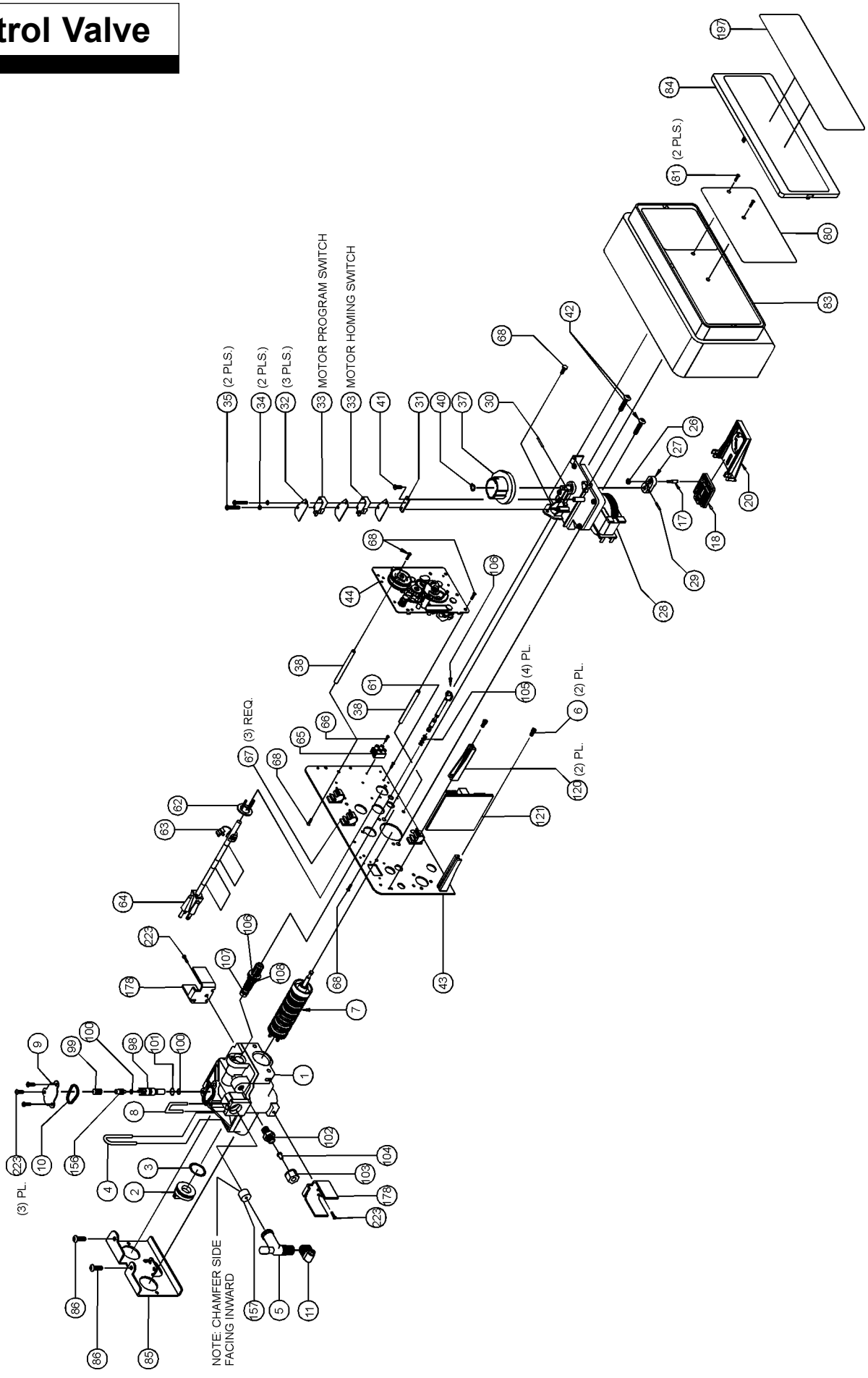
## Automatic Clock Timer



# Timer with Soft-Minder® Meter



# Control Valve

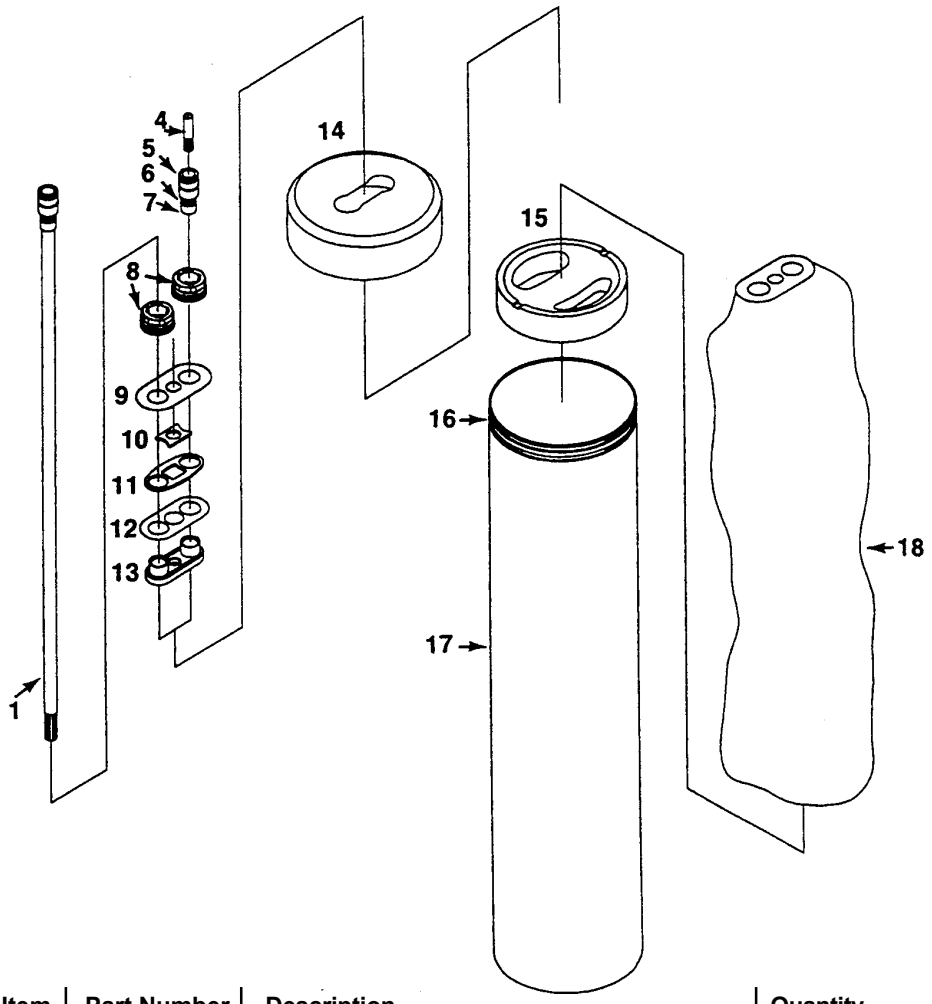


# Control Valve Parts List

| Item | Part No. | Description |
|---|---|---|
| | 01-0037-43 | Control Valve Assembly - Mark 89, TC |
| | 01-0037-44 | Control Valve Assembly - Mark 812, TC |
| | 01-0137-03 | Control Valve Assembly - Mark 89, SM |
| | 01-0137-04 | Control Valve Assembly - Mark 812, SM |
| 1 | 00-4498-65 | Control Valve |
| 2 | 00-4481-26 | Rear Body Plug |
| ‡3 | 00-4449-14 | O-Ring |
| 4 | 00-4481-28 | Retainer, Rear Body Plug |
| ‡5 | 00-4468-35 | Drain Elbow Assembly w/O-Ring |
| 6 | 00-3184-78 | Screw |
| ‡7 | 01-0130-83 | Seal Pack Assembly |
| 8 | 00-4473-87 | Retainer, Drain Elbow |
| 9 | 00-4010-22 | Eductor Port Cover |
| ‡10 | 00-4457-97 | Gasket |
| 11 | 00-4517-01 | Clamp |
| 17 | 01-0126-49 | Follower |
| 18 | 01-0126-48 | Yoke |
| 20 | 01-0126-47 | Bracket |
| 22 | 00-3185-50 | Screw |
| 26 | 00-3183-54 | Nut |
| 27 | 00-4452-21 | Bellcrank |
| ‡28 | 01-0136-03 | Drive Motor & Bracket Assembly, 120V/60 Hz |
| 29 | 00-4452-46 | Roll Pin |
| 30 | 00-4435-59 | Roll Pin |
| 31 | 00-4010-40 | Switch Bracket |
| 32 | 00-4452-72 | Barrier |
| ‡33 | 00-4452-44 | Switch |
| 34 | 00-3183-43 | Washer |
| 35 | 00-4486-86 | Screw |
| 37 | 01-0130-31 | Cam |
| 38 | 01-0129-28 | Spacer |
| 40 | 00-4486-59 | Retaining Ring |
| 41 | 00-3184-55 | Screw |
| 42 | 00-3184-52 | Screw |
| 43 | 01-0083-40 | Control Back Plate |
| ‡44 | 00-4429-21 | Timer Mechanism, 6 Day, 120V/60 Hz - TC Models |
| 61 | 00-3318-78 | Screw |
| 62 | 00-4444-53 | Strain Relief Adapter |
| 63 | 00-4444-52 | Strain Relief |
| 64 | 00-4429-84 | Power Cord |
| 65 | 00-3318-48 | Terminal Strip |
| 66 | 00-4442-84 | Screw |
| 67 | 00-4015-67 | Clip |
| 68 | 01-0017-84 | Screw |
| 80 | 00-4429-29 | Label |
| 81 | 00-4022-01 | Screw |
| 83 | 01-0128-09 | Control Cover |
| 84 | 00-4457-80 | Cover Plate |
| 85 | 01-0046-89 | Cul-Flo Bracket |
| 86 | 00-3183-83 | Screw |
| ‡98 | 00-4012-48 | Eductor w/O-Rings |
| 99 | 00-4452-69 | Eductor Screen |
| ‡100 | 00-3084-38 | O-Ring |
| ‡101 | 00-3084-37 | O-Ring |
| 102 | 00-4432-91 | Connector Brine Line |
| 103 | 00-3031-93 | Nut, PP, 0.312" |
| 104 | 00-3031-92 | Insert, PP, 0.312" |
| ‡105 | 00-4479-87 | O-Ring |
| ‡106 | 01-0136-06 | Eductor Sleeve and Eductor Piston Assembly |
| 107 | 00-4479-86 | O-Ring |
| 108 | 00-3084-07 | O-Ring |
| 120 | 01-0082-55 | Meter Mounting Bracket |
| ‡121 | 01-0101-27 | Circuit Board - 120 Volt |
| ‡156 | 00-4460-38 | Eductor Nozzle - Blue, 9" Tanks |
| | 00-4460-39 | Eductor Nozzle - Light Brown, 12" Tanks |
| 157 | 00-3316-45 | Backwash Flow Restrictor, #2, Brown, 9" Tanks |
| | 00-3316-36 | Backwash Flow Restrictor, #3, Green, 12" Tanks |
| 178 | 01-0051-30 | Bracket |
| 197 | 00-4462-96 | Decal, Mark 89 |
| | 00-4462-97 | Decal, Mark 812 |
| 223 | 00-4486-87 | Screw |
| * | 01-0051-26 | Noise Suppressor - SM Models |
| * | 01-0079-01 | Wire Harness, Circuit Board - SM Models |
| * | 01-0079-02 | Wire Harness, Regen. Switch - SM Models |
| * | 01-0112-79 | Flow Meter Assembly - SM Models |
| * | 00-4029-54 | Cam Wire Harness - TC Models |
| * | 00-4029-55 | Cam Wire Harness - SM Models |
| * | 00-3308-32 | Hat Screen - SM Models |

‡ Recommended Spare Parts
* Not Illustrated

# Conditioner Tank & Parts List

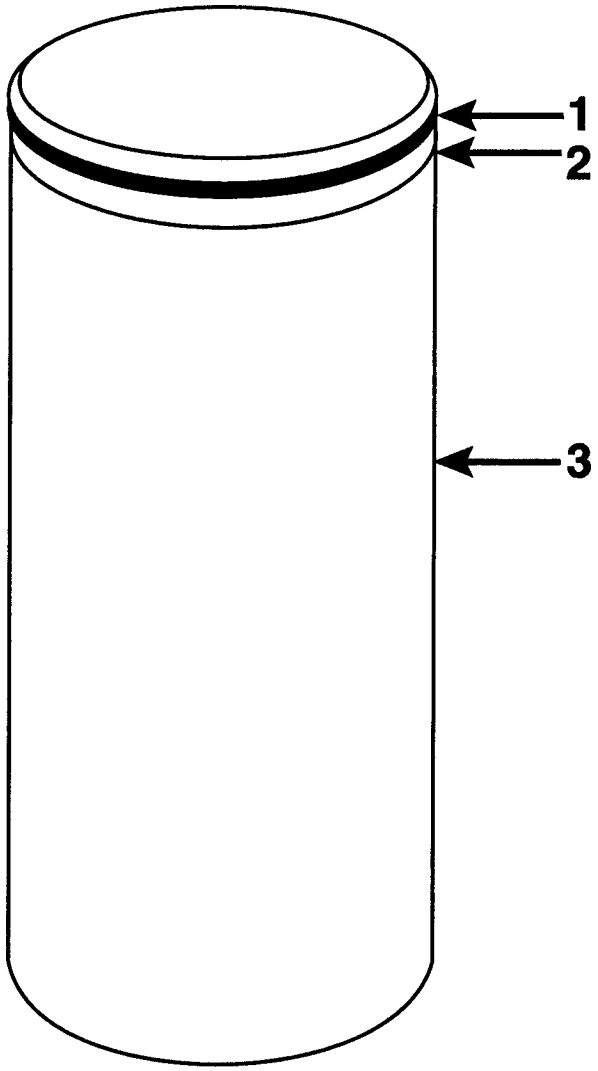



| Item | Part Number | Description | Quantity |
|---|---|---|---|
| | 01-0037-55 | Tank Assembly, 9" Time Clock, Complete | |
| | 01-0037-58 | Tank Assembly, 12" Time Clock, Complete | |
| | 01-0042-98 | Replacement Tank, 9" Time Clock, Empty | |
| | 01-0042-99 | Replacement Tank, 12" Time Clock, Empty | |
| 1 | 01-0072-81 | Outlet Manifold | 1 |
| 4 | P0-2320-07 | Inlet Manifold / MP 25 | 1 |
| 5 | P0-3339-57 | O-Ring / MP 25 | 1 |
| 6 | P0-3044-11 | O-Ring / MP 25 | 2 |
| 7 | 01-0072-82 | Inlet Adaptor | 1 |
| 8 | 01-0072-83 | Nut, Plastic | 2 |
| 9 | 01-0072-88 | Cover Plate | 1 |
| 10 | 01-0021-19 | Plate | 1 |
| 11 | 01-0054-50 | Gasket | 1 |
| 12 | 00-3232-05 | Barrier | 1 |
| 13 | 01-0072-85 | Yoke | 1 |
| 14 | 01-0019-46 | Cover, 9" | 1 |
| | 01-0019-47 | Cover, 12" | 1 |
| 15 | 00-4445-85 | Crush Pad, 9" | 1 |
| | 00-4445-46 | Crush Pad, 12" | 1 |
| 16 | 00-4419-97 | Gasket, Ring, 9" | 1 |
| | 00-4446-45 | Gasket, Ring, 12" | 1 |
| 17 | 00-4445-83 | Well, 9" | 1 |
| | 00-4446-44 | Well, 12" | 1 |
| 18 | 00-2202-36 | Liner, 9" | 1 |
| | 00-2202-22 | Liner, 12" | 1 |

# Salt Storage Tank Parts List

| Item | Part No. | Description |
|---|---|---|
| — | 00-4413-90 | Brine System, 160 lb. Replacement |
| — | 00-4418-86 | Brine System, 250 lb. Replacement |
| — | 00-4418-87 | Brine System, 375 lb. Replacement |
| †1 | 01-0048-70 | Gold Band |
| 2 | 00-3039-93 | Cover with Band, 250 lb. (114 kg) |
| | 00-4010-42 | Cover with Band, 160 lb. (73 kg) |
| | 00-3039-80 | Cover with Band, 375 lb. (170 kg) |
| 3 | 00-3040-10 | Tank Only, 250 lb. (114 kg) |
| | 00-4413-91 | Tank Only, 160 lb. (73 kg) |
| | 00-3039-75 | Tank Only, 375 lb. (170 kg) |
| * | 00-3044-30 | Salt Plate, Plastic, 250 lb. (114 kg) |
| * | 00-3044-39 | Salt Plate, Plastic, 350 lb. (159 kg) |

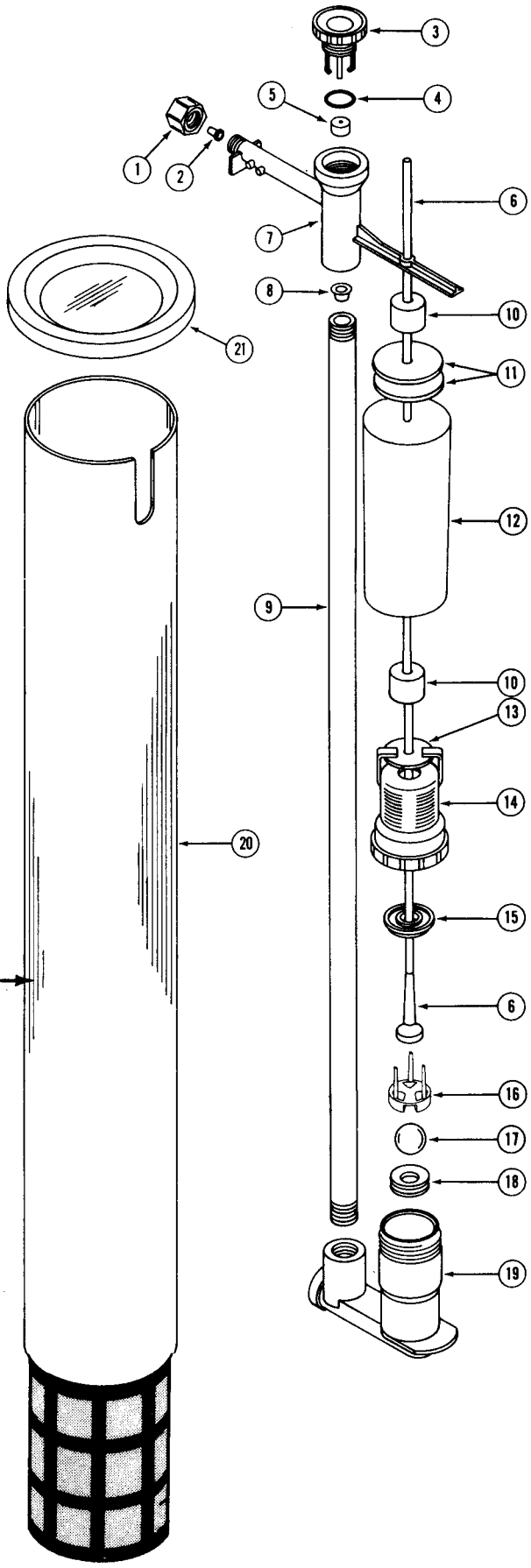
* Not Illustrated
† Order by footage required



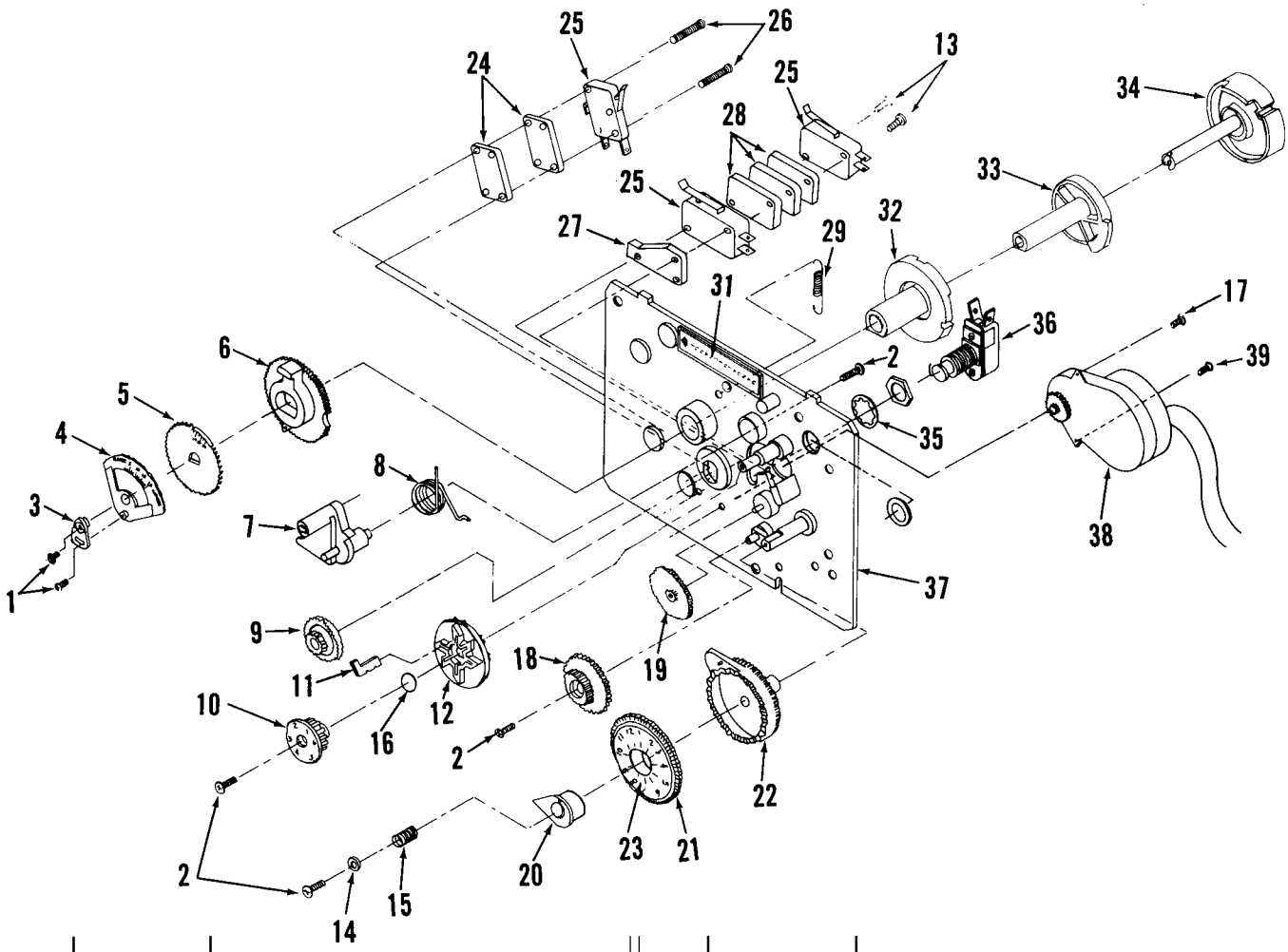
# Brine Valve & Parts List

| Item | Part Number | Description |
|---|---|---|
| — | 00-4418-88 | Brine Valve Assembly |
| — | 00-4011-41 | Brine Valve Assy., Brine Tank, 160 lb. |
| 1 | 00-3031-93 | Plastic Nut, 5/16-inch |
| 2 | 00-3031-92 | Plastic Insert |
| 3 | 00-4407-96 | Refill Cap |
| ‡4 | 00-3084-07 | O-ring |
| ‡5 | 00-4016-22 | Flow Restrictor, No. 5, 0.45 gpm (170 lpm) |
| 6 | 00-3400-14 | Stem Seat Assy., 250 lb. (114 kg) & 375 lb. (170 kg) (US) & 350 lb. (159 kg) (Canadian) |
| 7 | 00-4407-95 | Refill Body |
| ‡8 | 00-3325-28 | Hat Screen |
| 9 | 00-2234-35 | Plastic Pipe, 1/4-inch NPT x 35 inches long, 250 lb. (114 kg) & 375 lb. (170 kg) (US) & 350 lb. (159 kg) (Canadian) |
| 10 | 00-3047-03 | Float Retainer (2 required) |
| 11 | 00-3047-18 | Float Weight, Stainless Steel (2) |
| 12 | 00-4448-73 | Float |
| 13 | 00-3320-72 | Screen Top Seal |
| 14 | 00-4446-64 | Filter Screen Cap |
| ‡15 | 00-4444-96 | Stem Seat |
| 16 | 00-4473-92 | Insert |
| 17 | 00-4477-81 | Air Eliminator Ball |
| ‡18 | 00-3048-04 | Ball Seat |
| 19 | 00-5418-21 | Float Valve Body with Ball Seat |
| | 00-5418-34 | Float Valve Body with Ball Seat, 150 lb. Brine Tank |
| 20 | 00-3045-37 | Brine Valve Chamber, 250 lb. (114 kg) & 375 lb. (170 kg) Salt Storage Tank (US) |
| | 00-4413-92 | Brine Valve Chamber, 160 lb. (Shown) |
| | † | Brine Valve Chamber, 350 lb. (159 kg) (Canadian) |
| 21 | 00-3046-06 | Cap, Brine Valve Chamber |
| * | 00-3184-92 | Screw, Brine Valve Chamber (Canadian) #10 - 16 x 1/2-inch TRS HD PHIL |
| * | 00-3306-29 | Connector Spacer, Brine Valve Chamber (Canadian) |
| * | 00-4463-88 | Screw, St. Steel, Brine Valve Chamber (US) |
| * | 00-4463-89 | Nut, St. Steel, Brine Valve Chamber (US) |

* Not Illustrated
† Replace with 00-3045-15 and relocate spacer
‡ Recommended Spare Parts



# Timer & Parts List




| Item | Part No. | Description | Item | Part No. | Description |
|---|---|---|---|---|---|
| | 00-4429-21 | Mark 89/812 Timer Replacement | 20 | 00-4409-40 | Pointer, Time of day |
| 1 | 00-4482-57 | Screw, #4-24 x 0.625" Phil. | 21 | 01-0013-85 | Dial, Time of day |
| 2 | 00-4031-54 | Screw, #4-24 x 0.312" Oval Hd. | 22 | 01-0013-84 | Wheel, Time of Regeneration |
| 3 | 00-4417-67 | Adjustment Lever | 23 | 01-0013-86 | Decal |
| 4 | 00-4413-35 | Dial, Salt Dosage | 24 | 00-4409-30 | Spacer |
| 5 | 00-4413-38 | Dial, Backwash | 25 | 00-4409-31 | Switch, Miniature |
| 6 | 00-4010-24 | Cam, Notched | 26 | 00-4475-72 | Screw, #4-24 x 0.875" Phil |
| 7 | 00-4045-02 | Lever, Manual Regeneration | 27 | 00-4421-48 | Spacer |
| 8 | 00-4409-32 | Spring | †28 | 00-4480-04 | Spacer |
| 9 | 00-4413-32 | Gear, Idler | 29 | 00-4412-63 | Spring |
| 10 | 00-4409-47 | Pin, Retainer | 31 | 00-4442-99 | Decal |
| 11 | 00-4409-28 | Pin | 32 | 00-4010-23 | Cam, Refill, Backwash |
| 12 | 00-4409-29 | Wheel, Interval | 33 | 00-4413-40 | Cam, Backwash |
| 13 | 00-4477-96 | Screw, #4-40 x 0.750" Rd. Hd. | 34 | 01-0017-58 | Cam, Fast Rinse |
| † | 00-4428-85 | Screw, #4-40 x 1.625" Lg. Slot | †35 | 00-3183-32 | Washer |
| 14 | 00-4406-30 | Washer | ‡†36 | 00-4416-77 | Switch, Push Button |
| 15 | 00-4031-39 | Spring | 37 | 00-4459-38 | Plate with Inserts |
| 16 | 00-4409-35 | O-ring | ‡38 | 00-4409-34 | Motor, Timer |
| 17 | 00-4414-08 | Screw, #4-24 x 0.250" Pan Hd. | 39 | 00-4414-10 | Screw, #4-40 x 0.250" Pan Hd. |
| 18 | 00-3354-29 | Gear, Gray | * | 00-3300-00 | Kit, Frequency Wheel, 6-Day |
| 19 | 00-4409-43 | Gear, Black | * | 00-3300-01 | Kit, Frequency Wheel, 7-Day |

† Used only for Aqua-Sensor®
‡ Recommended Spare Parts
* Not Illustrated